

Dataset description for Zeiss HackaTUM challenge

Temperature control plays a dynamic role in ensuring the proper operation of microscopes. This includes sample temperature stabilization as well as thermal control of sensitive equipment electronics. Thermal fluctuations can degrade the quality of the microscopic imaging, and lead to a break down in the composition of the sample under examination.

For any microscope, several temperature control components exist.

In this dataset, we look at a specific type of Zeiss microscopes called [Light Microscope \(LM\)](#). Attached to some of these microscopes are devices called [LSM 980](#), which provide solutions for producing the best quality in confocal 4D imaging. In order to monitor the temperature of these microscopes, we attach different sensors for this purpose. Hence the dataset for this challenge is a time-series dataset of the temperature readings.

Table a below provides a description of the columns of the dataset and **Table b** provides a description of sensors responsible for reading the temperatures of some temperature control components featured in our dataset.

DOWNLOAD: Click [here](#) to download the dataset. Please contact us immediately if you have any problems downloading the dataset.

Table a: Dataset Columns Description

Column name	Description	Sample / unique values/ Additional Information
source_id	This represents the ID of a microscope. This column features different microscopes for which sensor readings were recorded for	The column features 24 devices
datetime	This represents the date and time for which a sensor observation was recorded	
region	This column features the region of the country in which the microscope is located	The column features 4 regions
UTCOffset	This column contains offset, in hours, from UTC of the timezone in which the temperature was recorded	
sensor_name	This column features the different sensors connected to the microscopes for which observations were made	The column features 19 different sensors
sensor_value	This column features the observed temperature value for the corresponding sensor	

Table b: Sensors Description

Category of Sensor	List of Sensors	Description
Room Temperature	LSM_HS_SensorCan81_Temperature_Room	Sensor component responsible for reading the 1) temperature of the room the microscope is placed in 2) temperature directly outside the microscope device
	LKM980_Main_Temperature_Outside	
<u>Peltier Heating and cooling component</u>	LSM_SR_Peltier_Temperature_Hot2	Sensors responsible for reading the temperature of Peltier heating and cooling components of the microscope
	LSM_SR_Peltier_Temperature_Cool2	
Liquid Coolants Components	LSM_HS_OW85_Temperature_MPM	Sensors responsible for reading the temperature of this category of liquid cooling components attached to the microscope
	LSM_HS_OW85_Temperature_Grabber	
	LSM_HS_OW85_Temperature_Enclosure	
	LSM_HS_OW86_Temperature_ScannerAmp	
	LSM_HS_TECO_Temperature_Hot1	
	LSM_HS_TECO_Temperature_Hot2	
Cooling Components	LSM_HS_TECO_Temperature_Cool1	Sensors responsible for reading the temperature of this category of TECO cooling components attached to the microscope
	LSM_HS_TECO_Temperature_Cool2	
Laser Control Module	LKM980_Main_Temperature_FPGA	Sensors responsible for reading the temperature of various laser control components
	LKM980_Main_Temperature_Inside	
	LKM980_Main_Temperature_Heatsink_FbgLkm980	
Controller Circuits	LSM_800_SR_Meta_Temperature_Controller	Sensors responsible for reading the temperature of various controller circuit components
	LSM_HS_TECO_Temperature_Controller	
	LSM_HS_VM800_Temperature_Controller	
	MicoIFHS_Temperature	
	LSM800_Main_Temperature	
	LSM_HS_PC_Temperature_Controller	